QUICK REFERENCE FOR STATUS OF ENVIRONMENTAL INDICATORS					
Name and EPA I.D. Number	Location (City or Town)	Current CA725 Decision	Current CA750 Decision	If Current Decision is Negative, Projected Date for Positive EI	
				CA725	CA750

4WD-*[RPB, FFB, ECB, STATE PROGRAM HEADING]*

SUBJ: Evaluation of *[Facility name]*'s status under the RCRIS Corrective Action Environmental Indicator Event Codes (CA725 and CA750)
EPA I.D. Number: *[I.D. Number]*

FROM: *[Facility Manager]*

THRU: *[Section Chief]*

TO: *[Branch Chief]*

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of *[facility name]*'s status in relation to the following corrective action event codes defined in the Resource Conservation and Recovery Information System (RCRIS):

1) Current Human Exposures Under Control (CA725),

2) Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the *[Federal Facilities, Enforcement and Compliance, RCRA Programs, or State Programs]* Branch Chief is required prior to entering these event codes into RCRIS. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate location within Attachments 1 and 2.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the *[first, second, third, etc.]* evaluation for *[facility's name]*. *[If this is not the first evaluation, then briefly present the results of the earlier evaluation and attach a copy of the earlier evaluation memo. As the number of reevaluations increases for a facility, the project manager will have to determine whether complete copies of the earlier*

evaluations need to be attached.]

III. FACILITY SUMMARY

[Insert a brief discussion on the land use surrounding the facility, the facility's location, operations, type of waste(s) generated, facility's regulatory status or any other general information on the facility which may assist the reader in understanding the facility.]

IV. CONCLUSION FOR CA725
(Brief Outline of Issues Leading to an EI of YE, NO or IN)

*[After completing the questions in Attachment 1, please summarize the CA725 conclusion here for easy reference by the Branch Chief or the general public. If the conclusion is that current human exposures are controlled, then please outline why a positive evaluation is reasonable (e.g., there are no complete current exposure pathways, complete current human exposures to contamination have been controlled by Interim Measures, etc.). **More importantly**, if the conclusion is that current human exposures are uncontrolled (i.e., NO) or that there is insufficient information available to make a decision (i.e., IN), then please outline what has caused the evaluation to be NO or IN (e.g., human exposures to contaminated soil exist, SWMUs 2, 5 and 11 have not been assessed yet, etc.). This brief explanation of why the evaluation is NO or IN will be critical in development of the next steps and the EI Interim Milestone Schedule in Section VI.}*

V. CONCLUSION FOR CA750
(**Brief Outline of Issues Leading to an EI of YE, NO or IN)**

*[After completing the questions in Attachment 2, please summarize the CA750 conclusion here for easy reference by the Branch Chief or the general public. If the conclusion is that migration of groundwater releases are controlled, then please outline why a positive evaluation is reasonable (e.g., migration of contaminated groundwater have been controlled by Interim Measures). **More importantly,** if the conclusion is that the migration of contaminated groundwater is uncontrolled (i.e., NO) or that there is insufficient information available to make a decision (i.e., IN), then please outline what has caused the evaluation to be NO or IN (e.g., the groundwater plume on the south side of the facility is still migrating, field data on the effectiveness of the Interim Measures system has not been collected/submitted yet, etc.). This brief explanation of why the evaluation is NO or IN will be critical in development of the next steps and the EI Interim Milestone Schedules in Section VI.]*

VI. SUMMARY OF FOLLOW-UP ACTIONS
(Discussion of What is Needed to Get to Yes, with EI Interim Milestone Schedule)

A. CA725

[Insert a brief discussion on what actions will be or are being taken by the RCRA/HSWA Program to control current human exposures which are not already controlled. If insufficient information on media contamination exists, then briefly explain what actions are to be taken to obtain the necessary information. If insufficient information is available on current human exposures, then explain what actions will be taken to obtain the necessary information. This discussion should conclude with a statement of when the negative indicator (i.e., NO or IN) will reach a Yes (e.g., It is projected that CA725 will reach YE in Fiscal Year 2003).] ***NOTE ON NEGATIVE EVALUATIONS: In addition to your narrative discussion, please include an EI Interim Milestone Schedule for completing those key actions items needed to allow for a Yes determination to be made for this facility.*** *For example,*

(*FACILITY NAME*)
EI INTERIM MILESTONE SCHEDULE
CA725

Activity(ies) (events as defined in RCRIS) [1]	**CA RCRIS Event Code**	**Scheduled Date** [2] (QTR& FY)	**Remarks** [3] (Include unit(s) and description of action(s))
example (e.g.): Stabilization Measures Implemented	*CA600*	*3/31/00*	*SWMU 17 – imposition of excavation and treatment of PCB contaminated soils above industrial RBC's SWMU 10 - imposition of institutional controls.*
e.g., Int. Measures Progress Report Received	*CA643*	*6/31/00*	*SWMU 10: Report on Institutional Controls Received*
e.g., Interim Measures Report Received	*CA640*	*9/31/00*	*SWMU 17: Report on completion of soil excavation*
e.g., Stabilization Construction Complete	*CA650*	*12/31/01*	*Review finds that Interim Measures undertaken have been completed at SWMUs 17 and 10.*
e.g., Current Human Exposures Under Control Determination	*CA725*	*12/31/01*	*Revised EI Memo*

[1] For activities, use RCRIS Corrective Action (CA) Event Codes as a reference. Given site specific nature and differences, each Project Officer should use **professional judgement** in determining which RCRIS CA Events Codes would apply based on approach being used. Remarks should be provided that outline what specific actions and milestones are occurring to support attainment of a positive EI determination.

If **none** of the **existing RCRIS CA Event Codes** fit the actions at your facility, a catch-all regional CA Event Code will be available for use. The regional CA Event Code will be provided at a later date. This catch-all RCRIS CA Event Code will be titled "Tech Memo/Report in Support of EI Determination."

[2] Use the **last day** of a Fiscal Quarter for the Scheduled Date – 12/31/XX, 3/31/XX, 6/30/XX, and 9/30/XX. The Scheduled Date for the estimated positive EI determination supplied in this memo should correspond to the Beginning of Year Plan (BYP).

[3] Include a brief summary of the **Remarks** in the corresponding RCRIS CA Event Code's Comment Field.

In developing your EI Interim Milestone Schedules, ***please keep in mind that the Interim Milestone Schedule will be used to track progress toward reaching a positive evaluation.***

A. CA750

[Insert a brief discussion on what actions will be or are being taken by the RCRA/HSWA Program to control the migration of contaminated groundwater. If insufficient information on media contamination exists, then briefly explain what actions are to be taken to obtain the necessary information. The discussion should conclude with a statement of when the negative indicator (i.e., NO or IN) will reach a Yes (e.g., It is projected that CA725 will reach YE in Fiscal Year 2003). ***] NOTE ON NEGATIVE EVALUATIONS: In addition to your narrative discussion, please include an EI Interim Milestone Schedule for completing those key actions items needed to allow for a Yes determination to be made for this facility.*** *For example,*

(*FACILITY NAME*)
EI INTERIM MILESTONE SCHEDULE
CA750

Activity(ies) (events as defined in RCRIS) [1]	**CA RCRIS Event Code**	**Scheduled Date** [2] (QTR& FY)	**Remarks** [3] (Include unit(s) and description of action(s))
example (e.g.), Stabilization Measures Implemented	*CA600*	*9/30/00*	*SWMU 1: imposition of SVE/AS system for VOC soil hot spot and GW plume*
e.g., Interim Measures Report Received	*CA640*	*6/30/01*	*SWMU 1: GW effectiveness and monitoring report for VOC plume.*
e.g., Stabilization Construction Complete	*CA650*	*9/30/01*	*Review of GW effectiveness monitoring report shows stabilization objectives to have been met.*
e.g., Migration of Contaminated Groundwater Under Control	*CA750*	*9/30/01*	*Revised EI Memo*

In developing your EI In terim Milestone Schedule, ***please keep in mind that the Interim***

Milestone Schedule will be used to track progress toward reaching a positive evaluation.

VII. LEVEL OF CONFIDENCE IN REACHING A POSITIVE EI EVALUATION AND MAJOR ISSUES

[If the evaluation is NO or IN for one or both of the Environmental Indicators, please offer an opinion on the level of confidence held in the schedule outlined in Section VI. In offering this opinion, please explain those major issues which greatly influence, positively or negatively, the level of confidence.]

Attachments:
1. CA725: Current Human Exposures Under Control
2. CA750: Migration of Contaminated Groundwater Under Control

Version: Interim Final
2/5/99

ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name: _____
Facility Address: _____
Facility EPA ID #: _____

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

    ____ If yes - check here and continue with #2 below,

    ____ If no - re-evaluate existing data, or

    ____ If data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"** [4] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater				
Air (indoors)[5]				
Surface Soil (e.g., <2 ft)				
Surface Water				
Sediment				
Subsurface Soil (e.g., >2 ft)				
Air (outdoors)				

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

____ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):_____

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[4] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[5] **Recent evidence (from the Colorado Dept. of Public Health and Enviro others) suggest that unacceptable indoor air concentrations are mo in structures above groundwater with volatile contaminants than pr believed. This is a rapidly developing field and reviewers are encourag the latest guidance for the appropriate methods and scale of demons necessary to be reasonably certain that indoor air (in structures loca (and adjacent to) groundwater with volatile contaminants) does not unacceptable risks**.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table Potential **Human Receptors** (Under Current Conditions)							
"Contaminated" Media	**Residents**	**Workers**	**Day-Care**	**Construction**	**Trespassers**	**Recreation**	**Food**[6]
Groundwater	Yes/No	Yes/No	Yes/No	Yes/No	N/L	N/L	Yes/No
Air (indoors)	Yes/No	Yes/No	Yes/No	N/L	N/L	N/L	N/L
Soil (surface, e.g., <2 ft)	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No
Surface Water	Yes/No	Yes/No	N/L	N/L	Yes/No	Yes/No	Yes/No
Sediment	Yes/No	Yes/No	N/L	N/L	Yes/No	Yes/No	Yes/No
Soil (subsurface, e.g., >2 ft)	N/L	N/L	N/L	Yes/No	N/L	N/L	Yes/No
Air (outdoors)	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	N/L	N/L

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not "contaminated" as identified in #2, please strike-out specific Media, including Human Receptors' spaces, or enter "N/C" for not contaminated.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations, some potential "Contaminated" Media - Human Receptor combinations (Pathways) are not assigned spaces in the above table (i.e, **N/L - not likely**). While these combinations may not be probable in most situations, they may be possible in some settings and **should be added as necessary**.

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major

[6] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

pathways).

____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and
Reference(s):____
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4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[7] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and
Reference(s):_____
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[7] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and
Reference(s):_____
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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

____ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the _____ _____ facility, EPA ID #_____, located at _____ under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) _____ Date _____
(print) _____
(title) _____

Supervisor (signature) _____ Date _____ [8]
(print) _____
(title) _____
(EPA Region or State) _____

Locations where References may be found:

_____
_____
_____
_____
_____

Contact telephone and e-mail numbers

(name)_____
(phone #)_____
(e-mail)_____

[8] **FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

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ATTACHMENT 2
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: _____
Facility Address: _____
Facility EPA ID #: _____

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   ____ If yes - check here and continue with #2 below,

   ____ If no - re-evaluate existing data, or

   ____ If data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[9] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

____ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):_____

[9] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[7] as defined by the monitoring locations designated at the time of this determination?

____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[7]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[10]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):_____

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[10] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

____ If yes - continue after identifying potentially affected surface water bodies.

____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and
Reference(s):_____

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5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[8] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature and number of discharging contaminants, or environmental setting) which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[8] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) providing a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[8] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[11] greater than 100 times their appropriate groundwater "levels," providing the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identifying if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown - enter "IN" status code in #8.

Rationale and
Reference(s):_____
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[11] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[12])?

____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[13] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale and
Reference(s):_____
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[12] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[13] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

____ If no - enter "NO" status code in #8.

____ If unknown - enter "IN" status code in #8.

Rationale and
Reference(s):_____

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

____ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the _____ _____facility , EPA ID # _____ , located at_____. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by(signature)_____ Date _____
(print)_____
(title)_____

Supervisor (signature)_____ Date_____
(print)_____
(title)_____
(EPA Region or State)_____

Locations where References may be found:

_____
_____
_____
_____
_____

Contact telephone and e-mail numbers

(name)_____
(phone #)_____
(e-mail)_____

Optional Exposure Pathway Evaluation Work Sheet
Referenced in CA725 - Question 3

Explanatory Footnotes:

Exposure Pathway Evaluation Work Sheet is a qualitative evaluation of the "completeness" of major pathways between contamination and exposures by plausible receptors. This screening only evaluates the major pathways (that are common at many/most contaminated site situations) and should not be used to reduce the scope of a site-specific risk assessment (which should include all pathways which may be significant at a given site).

Additional note: The following are special situations in which project managers should be cautious about using benchmark or other generic screening levels that have been derived with specific assumptions. In any of the situations, the risk manager should have a risk assessor provide assistance to review the use of the screening models.

1) The use of screening levels when multiple contaminants are present at a site; most guidances were developed for single contaminant exposures scenarios and are not appropriate to consider compounded or synergistic effects of multiple contaminants.

2) The use of screening levels when multiple routes of exposure are possible for given contaminant; some of the screening guidances consider multiple exposure routes but all of them do not.

3) The use of soil screening levels at sites with oily soils, free phase hydrocarbon on the groundwater, and free phase hydrocarbon below the water table; the guidances were developed assuming water leaching of soils not oil transport of contaminants through soils.

Optional Exposure Pathway Evaluation Work Sheet
Referenced in CA725 - Question 3

(1/5/99 Draft)

Screening Potentially Complete Pathways for Contaminated GROUNDWATER

Off-site GW Cont.	wells impacted? wells not "	Potable use Non-potable uses	Phyl/Inst. controls? (e.g., treatment @ wellhead?) Watering plants? Swimming pools? Showering??	Resident (ingestion) (inhalation) (dermal)
On-site GW Cont.	wells impacted? wells not "	Potable use Non-potable uses	Phyl/Inst. controls? (e.g., gw-use restrictions?) Process-water exposures? Watering landscaping? Showering??	Worker (M) (ingestion) (inhalation) (dermal)
On- or Off-site GW Cont.	const. into gw expected? " " not "		Phyl/Inst. controls? (e.g., PPE/Training req?)	Const. Work. (inhalation) (dermal cont.)
On- or Off-site GW	irrigation of veg./fruit expected? " veg../fruit not "		Phyl/Inst. controls? (e.g, testing/restrictions?)	Food Supply (Ingestion) Cont.

Screening Potentially Complete Pathways for Contaminated SURFACE SOIL

Off-site SS Cont.	contam. expected contam. not "	Private yards, etc. Not heavy use areas	Phyl/Inst. controls? (e.g., vegetation, etc.)	Resident Recreator (ingestion) (dermal cont.) (inhalation)
On-site SS Cont.	contam. expected contam. not "	High use/maint. areas? Not heavy use areas	Phyl/Inst. controls? (e.g., PPE/Fencing?) (Ok for children?)	Worker (M) Trespasser (ingestion) (inhalation) (dermal)
On- or Off-site cont. SS Cont.	construction expected? construct. not "		Phyl/Inst. controls? (e.g., PPE/Training req?)	Const. Work. (ingestion) (inhalation) (dermal cont.)
On- or Off-site SS Cont.	veg./fruit/game expected? veg./fruit/game not "		Phyl/Inst. controls? (e.g., Testing/Restrictions?)	Food Supply (Ingestion)

Screening Potentially Complete Pathways for Contaminated SURFACE WATER/SEDIMENT

Off-site SW/S Cont.	contam. expected? contam. not " " not expected	Water supply intakes?	Phyl/Inst. controls? (e.g., treated prior to)	Resident (ingestion) (inhalation) (dermal cont.)
Off-site SW/S Cont.	contam. expected? contam. not "	Private yards, etc. Not heavy use areas	Phyl/Inst. controls? (e.g., remoteness?) (children?)	Resident Recreator (ingestion) (inhalation) (dermal cont.)
On-site SW/S Cont.	contam. expected contam. not "	High use/maint. areas? Not heavy use areas	Phyl/Inst. controls? (e.g., fences/signs?) (children?)	Worker (M) Tresspassor (ingestion) (inhalation) (dermal cont.)
On- or Off-site SW/S Cont.	construct. expected? construct. not "		Phyl/Inst. controls? (e.g., PPE/training req?)	Const. Work. (ingestion) (inhalation) (dermal cont.)
On- or Off-site SW/S Cont.	fish/shellfish/veg./game expected? fish/shellfish/veg./game not "		Phyl/Inst. controls? (e.g., consumption restrictions?)	Food Supply (Ingestion)

Screening Potentially Complete Pathways for Contaminated SUB-SURFACE SOIL

On- or Off-site SubSoil Cont.	construction expected? construct. not "	Phyl/Inst. controls? (e.g., PPE/training req?)	Const. Work. (ingestion) (inhalation) (dermal cont.)
On- or Off-site SubSoil Cont.	deep rooted veg./fruit expected? " veg./fruit not "	Phyl/Inst. controls? (e.g., planting restrictions?)	Food Supply (ingestion)

Screening Potential Pathways for Contaminated INDOOR AIR

Contamination in groundwater, surface or subsurface soil, surface water, or sediments;

Adjacent to homes?	vapors/particulates likely?	Phyl/Inst. controls?	Resident
" not " "	no " "	(e.g., barriers/veg.)	(inhalation-indoors)
Adj. to workplace bldgs?	vapors/particulates likely?	Phyl/Inst. controls?	Worker
" not " "	no " "	(e.g., barriers/veg.)	(inhalation-indoors)

Outdoor Air - Addressed in Earlier Pathways

Examples of Exposure Controls

1. Physical Exposure Controls

Caps
Fences/walls
Security Guards
Vegetative Cover
Natural Inaccessibility
Remoteness/Unattractiveness
Treatment of media (prior to exposure)
Vapor barriers / ventilation systems

2. Institutional Exposure Controls

Posted Signs
Land-use Restrictions (e.g., zoning, deed, Responsible Party statements)
Level of PPE (Personal Protection Equipment)
Safety Training / Newsletters
Activity Permits / Notifications (e.g., construction permits / notifications)
Well Restrictions
Media-use Restrictions
Responsible Party statements of activity / use restrictions
Testing / Montitoring (and restrictions if necessary)
Consumption Restrictions
Restrictions on Frequency of Exposures